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Continuous GPS observations using prepaid mobile data communication

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Recently, expanded service area for mobile phone and offer of flat-rate charge plan by each vender have made it possible for mobile data communication to use for seismic data transmission between remote observation site and data center (e.g., Hirahara and Hori, 2009; Okubo, 2009; Matsushima and Uehira, 2010). Kyushu University (2010) used prepaid mobile data-communication device (b-mobile3G hours180, Japan Communications Inc.) for transferring GPS observation data files. Compared to mobile data communication and wired internet connection service (FLET's Service, NTT), prepaid mobile data-communication device is convenient and inexpensive.

In early Apr. 2010, Japan Communications Inc. released new prepaid SIM card named as "b-mobileSIM U300" for mobile data communication. This SIM card provides service of flat-rate data communication for a year with transmission speed of over 300kbps (both upload and download). We installed the data-communication device with b-mobileSIM U300 in two volcano GPS sites (Suwanosejima volcano and Sakurajima volcano-Gongen) and new five GPS sites (Yamanome junior high school, Ichinoseki city museum, Hondera elementary school (Ichinoseki city, Iwate prefecture), Tamugino (Tendo city, Yamagata Prefecture), and Higashine city hall (Higashine city, Yamagata Prefecture). These networking systems are based on Kyushu University (2010). In the two volcano sites, we are operated the networking systems for an hour in every day using motor time switch, because of these devices are operated by limited DC power supplies through solar cell. In other five sites, we can use commercial AC power supplies, so that data connections are always available. Our inexpensive mobile networking system makes it possible to data connection between remote area GPS sites and data center at all times. We think that this mobile system is useful for immediate GPS observations when disastrous large earthquakes and volcano eruptions occur.

Keywords: continuous GPS observation, prepaid mobile data communication, data transfer